Tuning Graphene Fermi Level for Raman Detection of Molecules

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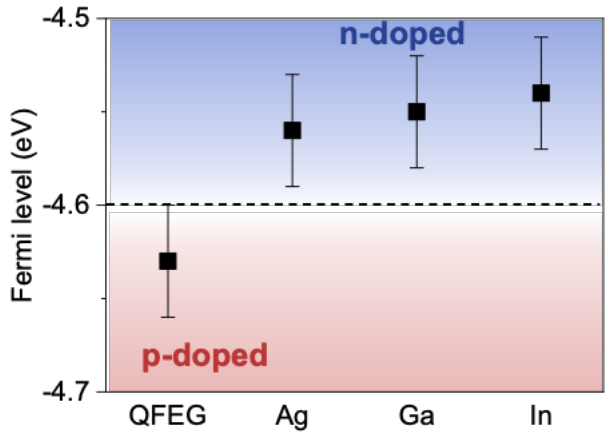
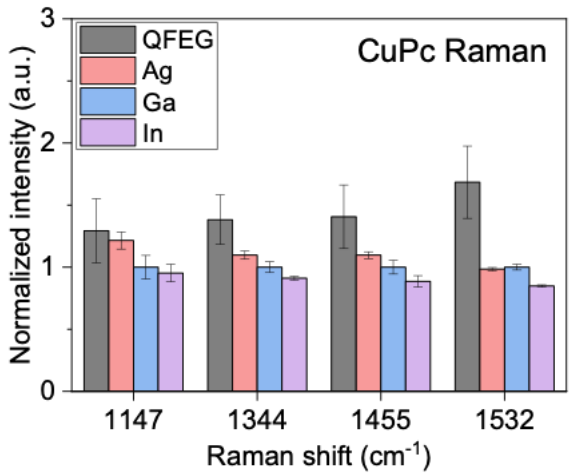
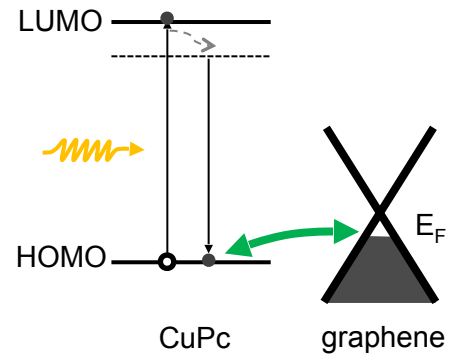
An IRG team utilized 2D metal intercalation to precisely and deterministically modify the Fermi level of overlaying graphene. Using copper phthalocyanine (CuPc) molecules, the team demonstrated that this Fermi level tuning can improve the Raman enhancement because of stronger charge transfer. This technique can be extended to a wide range of molecules, contributing to an enhanced selectivity for molecule detection.

This new way of tuning the graphene Fermi level can promote precise control and optimization of Raman enhancement, which will benefit the development of highly sensitive, specific, and reliable sensors.





More charge transfer in quasi-freestanding graphene



Less charge transfer in 2D metal